SPECTRAL REFLECTANCE STUDIES OF NERNST CRATER ON THE MOON USING CHANDRAYAAN-1 M3 DATASETS

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Abstract

Nernst impact crater is located in the highland region and has a diameter of 116 km. It is situated on the northwestern limb of the Oceanus Procellarum [1]. It has a Floor Fractured Crater (FFC) associated with a series of concentric fractures and a domical floor profile. This study investigates the morphology and mineralogy of the crater. From the mineralogy, analysis was carried out in the present study area to identify various minerals such as LCP, Highland Material, and Plagioclase. Using M3 datasets, an Integrated Band Depth-based Color Composite Image was generated to differentiate among similar spectral profiles [2] [3]. The Nernst crater lies on the feldspathic Highland Terrane, which exhibits an anorthosite signature on the crater rim, floor, and central peak. The morphological analysis was carried out using Lunar Reconnaissance Orbiter and Kaguya DEM images identified features such as uplifted central peak, dome, fractures, rilles, rim, rolling stone, Double Impact crater, convex floor, and wall terrace are marked on the morphological map. There is an additional impact crater, Nernst T just on the western rim edge of the Nernst crater. Nernst T crater contains rolling stone, rock boulders, domes, lunar slump, and minerals such as Low Calcium Pyroxene (LCP) and Pure Crystalline Plagioclase. The integrated analysis reveals that anorthosite was present in and around the Nernst crater and that the study area is classified as a class 2 floor fractured crater.

References:

[1] Donaldson et al. (2014) *Journal of Geophysical Research Planets,119 1516–1545,* [2] Mustard. (2011) *Journal of Geophysical Research, 116.* [3] Besse et al. (2011) *Journal of Geophysical Resource, 116, 1-15*